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ABSTRACT

This paper is a report on a study of public-school teachers' salaries in Iowa. The general purpose of the study was to better understand how recent teacher-compensation legislation would affect the Iowa education system. Specific goals were to examine the current Iowa public-school salary schedules and salaries across time (1984-2002); to compare Iowa teachers' average salaries to salaries of teachers in other states; to estimate the major independent factors that affect Iowa teacher salaries; and to investigate the role that salary plays in teacher retention. Data for the study were gathered from teachers' unions and state records. Multiple regression analyses were used on the data, and descriptive analyses were conducted for the significant variables. The results show the following. Iowa public-school teachers' salaries have increased over the years. Teachers' average salaries in Iowa are lower than national average salaries. The legislation improved teachers' salaries but did not change the independent factors that affect the salaries. (Those factors are teacher education, years of teaching experience, and district enrollment.) Salary, education, and experience influence teacher retention. The study concludes that higher teacher salaries do attract high-quality teachers and do affect teacher retention. (Contains 12 tables and 7 references.) (WFA)

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# A Close Look at Iowa Public School Teacher Salaries

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## Introduction

During the 2001 legislative session, Iowa lawmakers passed the teacher compensation bills. The bills appropriate $40 million in FY2002 for Iowa student achievement and teacher quality programs. A total of $31.2 million is used to improve teacher salaries, some amount of the $40 million will be spent on beginning teacher mentoring and induction, and the balance money will be used to implement a career development program and an evaluator-training program. What impact do teachers' salaries have on the education system? The Condition of Education by the National Center for Education Statistics (NCES) pointed out "Increased salaries potentially provide a means of attracting and retaining the increased numbers of quality young teachers who will be needed in the years ahead" (NCES, 1999). The teacher compensation legislation is an effort to improve student learning, to improve teacher quality, to eliminate teacher shortages, and to improve the comparability of Iowa teachers' salaries with those in other states.

The purposes of this study are to examine current Iowa public school teacher salary schedules and Iowa teacher salaries across time; to compare Iowa teacher average salary to the average salaries for teachers in other states; to estimate major independent factors which impact Iowa teacher salaries; and to investigate the role that salary plays in teacher retention. The general goal is to better understand how the teacher compensation legislation will impact the Iowa education system, the local education agencies (LEAs), and public school teachers.

## Data

The average public school teacher salaries for Iowa and other states are presented in Ranking of the States and Estimates of School Statistics published annually by the National Education Association (NEA). The teacher salaries across state comparisons are also available from Survey and Analysis of Teacher Salary Trends by the American Federation of Teachers (AFT). Iowa teacher salary data are collected through the Iowa annual Basic Educational Data Survey (BEDS). The BEDS staff database includes teacher

background, curriculum assignment, and salary information. The enrollment database contains school district and student information. The different years of staff and enrollment files can be linked by a common district and school code system. Nine years of teachers' data from BEDS and district enrollment data (1984-85, 1985-86, 1990-91, 1991-92, 1994-95, 1995-96, 1999-00, 2000-01, and 2001-02) are employed in this study.

## Method/Analyses

### Multiple Regression

Multiple regression analyses are used on the data with five different years of teachers' information (1985-86, 1990-91, 1995-96, 2000-01, and 2001-02). Teacher salary is the dependent variable in the regression models. Teacher characteristics, such as teachers' education, total years of teaching experience, sex, and age, plus district enrollments are the independent variables. One model will be tested for each year's data set. Sex was entered into equations as a dummy variable (male as 1, and female as 0). If there is gender difference, two different models will be tested-one for male teachers and another one for female teachers.

### Descriptive Statistics for Group Break Down

By applying the regression method identifying the major independent factors that impact Iowa teacher salaries most, some descriptive analyses were conducted for the significant variables (such as teacher education, teaching experience, district enrollment, and sex). Average salaries of the subgroup teachers (such as within a gender group or a degree group) were calculated.

### Teacher Retention - Examining with Descriptive Statistics and Logistic Regression

Five pairs of annual staff data will be used to study teacher retention (1984-85 vs. 1985-86, 1990-91 vs. 1991-92, 1994-95 vs. 1995-96, 1999-00 vs. 2000-01, and 2000-01 vs. 2001-02). In this study, the retention teachers were the teachers in the previous year that retained at the same district to teach in next year. To differentiate the retiring teachers from the non-return teachers, only those non-eligible to retire teachers were included in the retention

study. Logistic regressions are employed to estimate the factors leading teachers retained or non-returned to the same district to teach. Return status is the dependent variable (return assigned with a value 1 and non-return as 0) in the equation. Teachers' salaries, teaching experience, education background, district enrollment, sex, and age are entered as independent variables in the models. After identifying the independent factors, some descriptive analyses are conducted for the significant variables.

## Results and Discussion

### Iowa Teacher Salary across Time

Data in Table 1 shows that Iowa teacher salaries have increased over the years. The largest increases were from 1985-86 to 1990-91 and from 1995-96 to 2000-01 because of the $18,000 minimum teacher salary law passed by 1987 Iowa legislation and the $23,000 minimum teacher salary law passed by 1998 Iowa legislation. Table 1 also shows a significant average salary increase from 2000-01 to the current year that reflects the 2001 legislation. The average salary increases for the beginning teachers are parallel to the salary increases for all full-time teachers.

Table 1 Average Salaries of Iowa Full-time Public School Teachers

| School Year | 1985-86 | 1990-91 | 1995-96 | 2000-01 | 2001-02 |
|---|---|---|---|---|---|
| All Full-time Public School Teachers | $21,645 | $27,948 | $32,371 | $36,479 | $38,230 |
| Beginning Full-time Public School Teachers | $14,785 | $19,489 | $21,481 | $26,058 | $27,553 |

### Iowa Teacher Salary Compares to Other States

Salary comparisons of public school full-time teachers for Iowa, the nation and other states in the region are reported in Table 2. The data are provided by the National Education Association's publication, Rankings of the States and Estimates of School Statistics. In 2000-01, Iowa ranked 36th in the nation in average teacher salaries, and Iowa average teacher salary was $6,419 below the nation average. Compared to other states in the region, Iowa teacher average salaries were less than the average teacher salaries in five of the eight surrounding states.

Table 2 Average Salaries of Public School Teachers for Iowa, Nation, and Midwest States 2000-01

| Nation/State | Average Salary | National Rank |
|---|---|---|
| **Nation** | **$42,898** | |
| **Iowa** | **$36,479** | **36** |
| Illinois | $48,053 | 9 |
| Kansas | $39,432 | 25 |
| Minnesota | $40,577 | 22 |
| Missouri | $36,764 | 35 |
| Nebraska | $34,175 | 46 |
| North Dakota | $30,891 | 50 |
| South Dakota | $30,265 | 51 |
| Wisconsin | $41,646 | 20 |

Table 3 shows several years of salary ranks in the nation for Iowa and other Midwest states. The ranks are based on the American Federation of Teachers' publication, the Survey and Analysis of Teacher Salary Trends. Over the years listed in Table 3, Iowa teacher average salaries ranked below about four of the eight other Midwest states (e.g., Illinois, Wisconsin, Minnesota, and Kansas). The similar trend can be found for the adjusted ranks by the AFT interstate cost-of-living index.

Table 3 State Rankings by Teacher Average Salary for Iowa and Midwest States

| | Original Ranks | | | | Adjusted Rank by AFT COL Index |
|---|---|---|---|---|---|
| **States** | 1989-90 | 1997-98 | 1998-99 | 1999-00 | 1999-00 |
| **Iowa** | **37** | **31** | **33** | **35** | **25** |
| Illinois | 14 | 10 | 10 | 11 | 4 |
| Kansas | 33 | 33 | 31 | 32 | 23 |
| Minnesota | 16 | 21 | 20 | 21 | 16 |
| Missouri | 34 | 32 | 35 | 36 | 31 |
| Nebraska | 39 | 41 | 43 | 44 | 37 |
| North Dakota | 48 | 50 | 50 | 49 | 50 |
| South Dakota | 51 | 51 | 51 | 51 | 49 |
| Wisconsin | 17 | 20 | 21 | 22 | 14 |

Independent Factors Impacting Iowa Teachers' Salaries

Table 4 through Table 6 show the regression results for 1990-91, 2000-01, and 2001-02 teacher's salary data (Similar results for 1985-86 and 1995-96 are eliminated because length of the paper). Teacher education, teaching experience, and district enrollment were predictors for all of the models of those target years. Gender was a predictor for every year salary as well. However, teacher age was a significant predictor for all the years except for 1985-86 data. The regression results indicate very well fitting models with a range of R-squares of .63 and .72 for all the data across the years. R-squares for the female teacher models were higher than the R-squares for the male teacher models, except 1985-86 data.

Table 4 Regression Results for 1990-91 Iowa Public School Full-time Teachers

| | | T for Ho: Parameter = 0 | PROB>T | F Value | PROB>F | $R^2$ | R |
|---|---|---|---|---|---|---|---|
| | Independent Variables | | | | | | |
| Overall | | | | 11453.46 | 0.0001 | 0.6615 | 0.8133 |
| | Education (Degrees) | 97.213 | 0.0001 | | | | |
| | Teaching Experience | 85.878 | 0.0001 | | | | |
| | District Enrollment | 59.693 | 0.0001 | | | | |
| | Sex | 41.769 | 0.0001 | | | | |
| | Age | -4.177 | 0.0001 | | | | |
| Male | | | | 3766.629 | 0.0001 | 0.6037 | 0.7770 |
| | Education (Degrees) | 50.802 | 0.0001 | | | | |
| | Teaching Experience | 36.237 | 0.0001 | | | | |
| | District Enrollment | 29.335 | 0.0001 | | | | |
| | Age | -6.443 | 0.0001 | | | | |
| Female | | | | 9071.314 | 0.0001 | 0.6514 | 0.8071 |
| | Education (Degrees) | 85.146 | 0.0001 | | | | |
| | Teaching Experience | 81.770 | 0.0001 | | | | |
| | District Enrollment | 53.794 | 0.0001 | | | | |
| | Age | -1.146 | 0.2517 | | | | |

Table 5 Regression Results for 2000-01 Iowa Public School Full-time Teachers

| | | T for Ho: Parameter = 0 | PROB>T | F Value | PROB>F | $R^2$ | R |
|---|---|---|---|---|---|---|---|
| | Independent Variables | | | | | | |
| Overall | | | | 16979.90 | 0.0001 | 0.719 | 0.8479 |
| | Education (Degrees) | 115.065 | 0.0001 | | | | |
| | Teaching Experience | 96.853 | 0.0001 | | | | |
| | District Enrollment | 85.018 | 0.0001 | | | | |
| | Sex | 32.629 | 0.0001 | | | | |
| | Age | 10.631 | 0.0001 | | | | |
| Male | | | | 4683.88 | 0.0001 | 0.6553 | 0.8095 |
| | Education (Degrees) | 49.756 | 0.0001 | | | | |
| | Teaching Experience | 42.644 | 0.0001 | | | | |
| | District Enrollment | 36.043 | 0.0001 | | | | |
| | Age | -1.673 | 0.0944 | | | | |
| Female | | | | 16950.33 | 0.0001 | 0.7441 | 0.8626 |
| | Education (Degrees) | 108.982 | 0.0001 | | | | |
| | Teaching Experience | 91.514 | 0.0001 | | | | |
| | District Enrollment | 80.781 | 0.0001 | | | | |
| | Age | 14.437 | 0.0001 | | | | |

Table 6 Regression Results for 2001-02 Iowa Public School Full-time Teachers

| | | T for Ho: Parameter = 0 | PROB>T | F Value | PROB>F | $R^2$ | R |
|---|---|---|---|---|---|---|---|
| | Independent Variables | | | | | | |
| Overall | | | | 16421.59 | 0.0001 | 0.711 | 0.843 |
| | Education (Degrees) | 96.366 | 0.0001 | | | | |
| | Teaching Experience | 115.039 | 0.0001 | | | | |
| | District Enrollment | 84.877 | 0.0001 | | | | |
| | Sex | 34.876 | 0.0001 | | | | |
| | Age | 9.028 | 0.0001 | | | | |
| Male | | | | 4344.24 | 0.0001 | 0.641 | 0.800 |
| | Education (Degrees) | 42.174 | 0.0001 | | | | |
| | Teaching Experience | 49.186 | 0.0001 | | | | |
| | District Enrollment | 34.94 | 0.0001 | | | | |
| | Age | -1.773 | 0.0762 | | | | |
| Female | | | | 16568.599 | 0.0001 | 0.7367 | 0.8583 |
| | Education (Degrees) | 90.847 | 0.0001 | | | | |
| | Teaching Experience | 108.995 | 0.0001 | | | | |
| | District Enrollment | 81.087 | 0.0001 | | | | |
| | Age | 12.479 | 0.0001 | | | | |

The models, by adding in interaction variables (such as gender by education, enrollment by education, gender by education by enrollment, and etc.) were a better fit than the models without interaction variables. However, the increases on R-squares were very small. The author of this study will focus on the main effects and will spend little time to discuss the interaction effects in this paper. Overall, teacher education and teaching experience heavily correlated with teacher salaries in all five years. District enrollment and gender showed the third and fourth highest correlation with teacher salaries. Age was a predictor for teacher salary in several years. However, age was always with the lowest T values in the models.

Descriptive Statistics Results by Groups

1) Teacher Education

Table 7 shows higher average salaries for teachers who had advanced degrees than the average salaries for teachers who had baccalaureate degrees only.

Table 7 Average Salaries by Teacher Education Background

| | With Baccalaureate Degrees | | With Advanced Degree | |
|---|---|---|---|---|
| School Year | % out of All Teachers | Average Salary | % out of All Teachers | Average Salary |
| 1985-86 | 71.2% | $20,101 | 28.8% | $25,581 |
| 1990-91 | 70.7% | $25,905 | 29.3% | $32,983 |
| 1995-96 | 72.1% | $30,007 | 27.9% | $38,549 |
| 2000-01 | 73.1% | $33,761 | 26.9% | $43,872 |
| 2001-02 | 73.3% | $35,502 | 26.7% | $45,733 |

2) Teaching Experience

If we group teachers by teaching experiences as five years or less and more than five years, the experienced group shows higher average salaries in all five years listed in Table 8.

Table 8 Average Salaries by Teaching Experience

| | Five Years or Less | | More Than Five Years | |
|---|---|---|---|---|
| School Year | % out of All Teachers | Average Salary | % out of All Teachers | Average Salary |
| 1985-86 | 18.1% | $16,446 | 81.9% | $22,834 |
| 1990-91 | 19.0% | $21,371 | 81.0% | $29,522 |
| 1995-96 | 19.3% | $24,113 | 80.7% | $34,370 |
| 2000-01 | 25.2% | $27,681 | 74.8% | $39,442 |
| 2001-02 | 25.7% | $29,624 | 74.3% | $41,211 |

3) District Enrollment

Table 9 contains average salaries for Iowa full-time public school teachers in four enrollment categories (less than 400 students, 400-999, 1,000-2,499, and equal to or more than 2,500 students). The distributions of teachers by enrollment category by percent are also available in Table 9. The average salaries varied directly with district enrollments. The larger school districts were more likely to have higher teacher salaries than the smaller districts were in every year listed. The salary gap between the teachers from the smallest districts and the teachers from the largest districts are increasing across time. However, the percent of teachers teaching in the small districts is lower now than 15 years ago.

Table 9 Average Salaries by District Enrollment

| | 1985-86 | | 1990-91 | | 1995-96 | | 2000-01 | | 2001-02 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Enrollment Category | % | Average Salary | % | Average Salary | % | Average Salary | % | Average Salary | % | Average Salary |
| < 400 | 9.5% | $17,422 | 8.8% | $22,951 | 5.0% | $26,152 | 5.5% | $29,864 | 5.4% | $31,607 |
| 400-999 | 26.7% | $19,715 | 26.4% | $25,569 | 26.1% | $29,292 | 25.1% | $33,213 | 25.2% | $34,937 |
| 1,000-2,499 | 22.3% | $21,616 | 23.6% | $27,852 | 25.4% | $32,304 | 25.7% | $35,912 | 25.0% | $37,676 |
| 2,500+ | 41.5% | $23,951 | 41.2% | $30,663 | 43.5% | $35,016 | 43.7% | $39,532 | 44.4% | $41,231 |
| State | | $21,645 | | $27,948 | | $32,371 | | $36,479 | | $38,230 |

4) Sex

There are more female teachers in Iowa public schools and the percentages of female teachers have increased over years. On average, female teachers make less money than their male counterparts (see Table 10). Part of the reasons for salary difference between male and female teachers might be because the male teachers were in higher experience levels and had a higher percentage of advanced degrees.

Table 10 Average Salaries for Iowa Full-time Public School Teachers by Gender

| | Male Teachers | | Female Teachers | |
|---|---|---|---|---|
| School Year | % out of All Teachers | Average Salary | % out of All Teachers | Average Salary |
| 1985-86 | 35.7% | $23,425 | 64.3% | $20,658 |
| 1990-91 | 33.4% | $30,148 | 66.6% | $26,844 |
| 1995-96 | 31.8% | $34,333 | 68.1% | $31,454 |
| 2000-01 | 29.5% | $38,297 | 70.5% | $35,718 |
| 2001-02 | 28.9% | $40,127 | 71.1% | $37,459 |

5) Interactions

Interactions between salary and experience and salary and education might cause the larger districts to attract more experienced and better-educated teachers. There was 65 to 70 percent of teachers in the smallest enrollment category with more than five years of experience, while 76 to 87 percent of the teachers in the largest enrollment category had more than five years of experience. Only about 11 percent of the teachers in the smallest enrollment category had advanced degrees while 40 percent of the teachers in the districts at the largest enrollment category held advanced degrees.

Teacher Mobility

Only those non-eligible retiring teacher data are examined for retention. In Iowa, the current criterion for teachers to retire is the combination of age and experience equal to or above 88 and a minimum age of 55. The results of logistic regression show that teacher salary, education background, and teaching experience were the leading factors affecting retention in a district. District enrollment was not significant in the equations even through the small districts showed smaller teacher retention rates while larger districts showed larger teacher retention rates. Age was another variable that did not show a significant effect on teacher retention.

Tables 11 and 12 show teacher average salaries broken down by retention status and by gender and education background from the data of two pairs of years. Teacher average years of experience broken down by the same groups are also shown in these two tables. The similar trends can be found for both 1994-95 vs. 1995-96 and 2000-01 vs. 2001-02 data. The non-retained female teachers with baccalaureate degrees had the lowest average

salaries and shortest experiences, while the retained male teachers with advanced degrees had the highest salaries and longest experiences.

Table 11 Average Salaries and Year of Experiences for the Teachers Non-Eligible to retire in 1994-95 with their 1995-96 Retained Statuses

| | | Female | | Male | |
|---|---|---|---|---|---|
| | | Non-Retained | Retained | Non-Retained | Retained |
| Baccalaureate Degrees | Salary | $25,850 | $28,787 | $26,925 | $30,587 |
| | Experience | 8.22 | 12.88 | 8.24 | 13.97 |
| Advanced Degrees | Salary | $33,948 | $36,320 | $36,384 | $38,800 |
| | Experience | 15.85 | 18.38 | 18.16 | 22.34 |

Table 12 Average Salaries and Year of Experiences for the Teachers Non-Eligible to retire in 2000-01 with their 2001-02 Retained Statuses

| | | Female | | Male | |
|---|---|---|---|---|---|
| | | Non-Retained | Retained | Non-Retained | Retained |
| Baccalaureate Degrees | Salary | $30,448 | $33,310 | $31,999 | $35,343 |
| | Experience | 8.24 | 12.55 | 8.25 | 13.13 |
| Advanced Degrees | Salary | $40,716 | $42,923 | $43,114 | $45,162 |
| | Experience | 15.67 | 18.98 | 18.75 | 21.52 |

## Conclusion

In summary, Iowa public school teachers' average salaries were relatively low compared to the nation and other Midwest states. The Iowa teacher compensation legislation made a good effort to improve Iowa teacher salaries and to improve Iowa education.

The similar results are found in all the regression studies and descriptive analyses across years. Iowa legislation improves teachers' salary but does not change the factors that impact the salary.

Teacher education and years of teaching experience were two leading variables predicting teacher salaries. Therefore, higher salaries may be one of the most important factors that in Iowa to attract more experienced and better-educated teachers to the larger school districts. The evidences showed that the teacher salary along with teacher education and experience influence teacher retention. In conclusion, higher teacher salaries do attract high quality teachers and do impact teacher retention.

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